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ABSTRACT

Eighty subjects 4, 6, 8, and 10 years of age inductively identified partially uncovered silhouettes of three simple pictures. Subjects removed as few as possible covering pieces, according to their own strategies, to correctly name the pictures. Performance generally improved with increased age on the two dependent measures, inductively inferring the identity of incomplete pictures and efficiently removing pieces on the silhouettes. A plateau in performance existed on the inductive inference measure between ages 6 and 8. Results indicate that young children reason inductively on nonwritten tasks judged appropriate for studying more complex forms of induction. (Author)

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The main objective of this study was to investigate developmental changes in children's ability to reason inductively. Subjects were required to identify picture stimuli on the basis of less than complete information thus satisfying the definition of inductive reasoning. Unique to the study was a test instrument that allowed subjects to use their own information gathering strategies.

Twenty subjects (10 males and 10 females) in each of the 4, 6, 8, and 10 year old age groups were tested. All were randomly sampled and were considered representative of children in the local area. The ethnic distribution was 16 blacks and 64 whites.

Silhouettes of pictures (bird, flag, and leaf) from a children's coloring book were used as stimuli. Totally covering the randomly presented silhouettes were 48 wooden squares (1-3/8 x 1-3/8 x 1/4 in.) in a 6 by 8 array. Without prior knowledge of the stimuli, subjects had to individually name each picture by the following procedure. Using their own strategies, subjects were asked to remove the squares (on the shaded picture), one at a time, and identify the picture as soon as possible. Subjects' verbal responses and square removal sequences were recorded for each picture.

A number of dependent measures were taken and two primary ones are reported here. The first dependent measure is an indication of inductive reasoning. This inductive inference score is defined by the percentage of picture uncovered until correct naming. The second dependent measure indicates how efficiently subjects gathered information. This efficiency score is defined as the percentage of squares removed that uncovered the silhouette to the total number of squares removed.

For both measures, main effects of Age and Pictures were significant. Sex was not a significant factor nor were any interactions significant.

The following table depicts the age-related improvement in scores for the two primary measures. While 4 year old subjects required more than 1/2 the picture exposed for correct identification, the exposure needed decreased to about 1/3 for the 10 year olds. This improvement was interrupted by a plateau effect between ages 6 and 8 similar to the unreported measures and other related studies.

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There is no counterpart to the efficiency score in related studies since information presentation was always experimenter rather than subject controlled. Results indicate that the monotonically improved square removal behaviors approach maximum efficiency by age 10.

	AGE			
SCORE	4	6	8	10
Inductive Inference	55%	42%	44%	37%
Efficiency	71%	79%	84%	93%

The test device was judged appropriate for follow-up studies. Subjects as young as 4 years of age exhibited inductive reasoning in a game-playing atmosphere. The instrument has potential for investigating developmental and more complex aspects of induction.

The study of inductive reasoning or the "scientific process" has often been neglected in favor of deductive reasoning. However, inductive reasoning is apparently used in a more global sense. The nature of our world actually prohibits collecting all representative information, thereby forcing conclusions on the basis of partial information, e.g., inferential statistics. Knowledge of the growth of inductive reasoning may help produce better educational programs to teach optimum usage of such processes.

This study indicated that performance related to collecting evidence and drawing accurate conclusions from incomplete picture data appears early and improves somewhat steadily. Six year olds were fairly proficient which is interesting since supposedly they do not entertain alternate possibilities until the formal operation stage of thinking.